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Gao

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(54) **HULA HOOP**

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<i>A63B 21/06</i>	(2006.01)
<i>A63B 21/065</i>	(2006.01)
<i>A63B 71/06</i>	(2006.01)
<i>A63H 33/02</i>	(2006.01)

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(52) **U.S. Cl.**

CPC *A63B 21/0608* (2013.01); *A63B 19/00* (2013.01); *A63B 21/065* (2013.01); *A63B 71/0669* (2013.01); *A63H 33/02* (2013.01); *A63B 2213/007* (2013.01)

(57) **ABSTRACT**

(58) **Field of Classification Search**

CPC . *A63B 21/0608*; *A63B 21/0605*; *A63B 19/00*; *A63H 33/02*
See application file for complete search history.

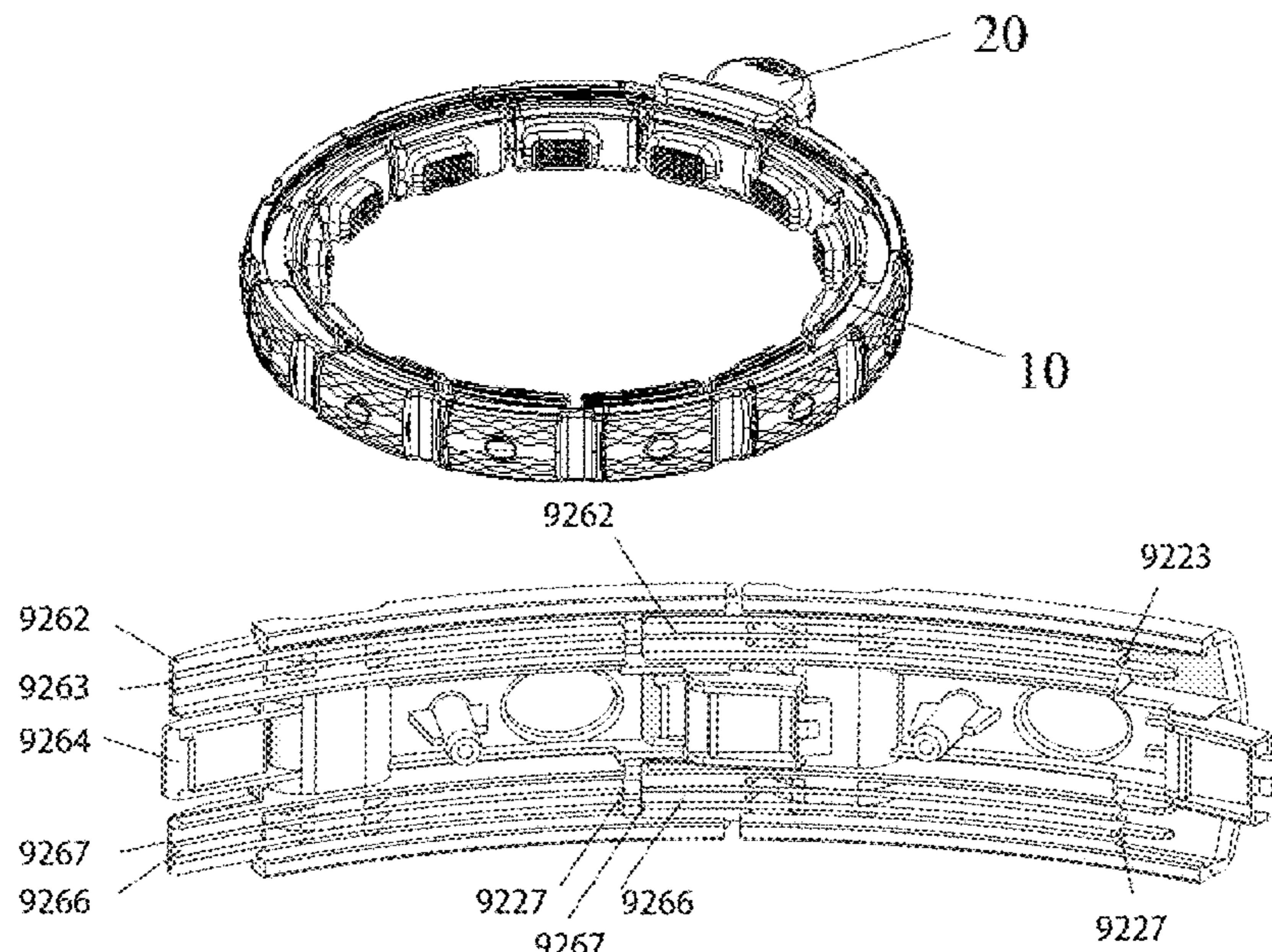
The present disclosure relates to a hula hoop. The hula hoop includes a track assembly with a plurality of track units interconnected end-to-end and a slider provided with rollers. The track unit includes an outer track having a receiving channel located at a first end and a protruding portion located at a second end opposite to the first end, a pressing component configured to secure two adjacent track units, and an inner track for jointly defining a circular path with the outer track. The rollers of the slider are configured to slide along the circular path. The hula hoop of the present disclosure is easy to assemble and disassemble.

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17 Claims, 7 Drawing Sheets



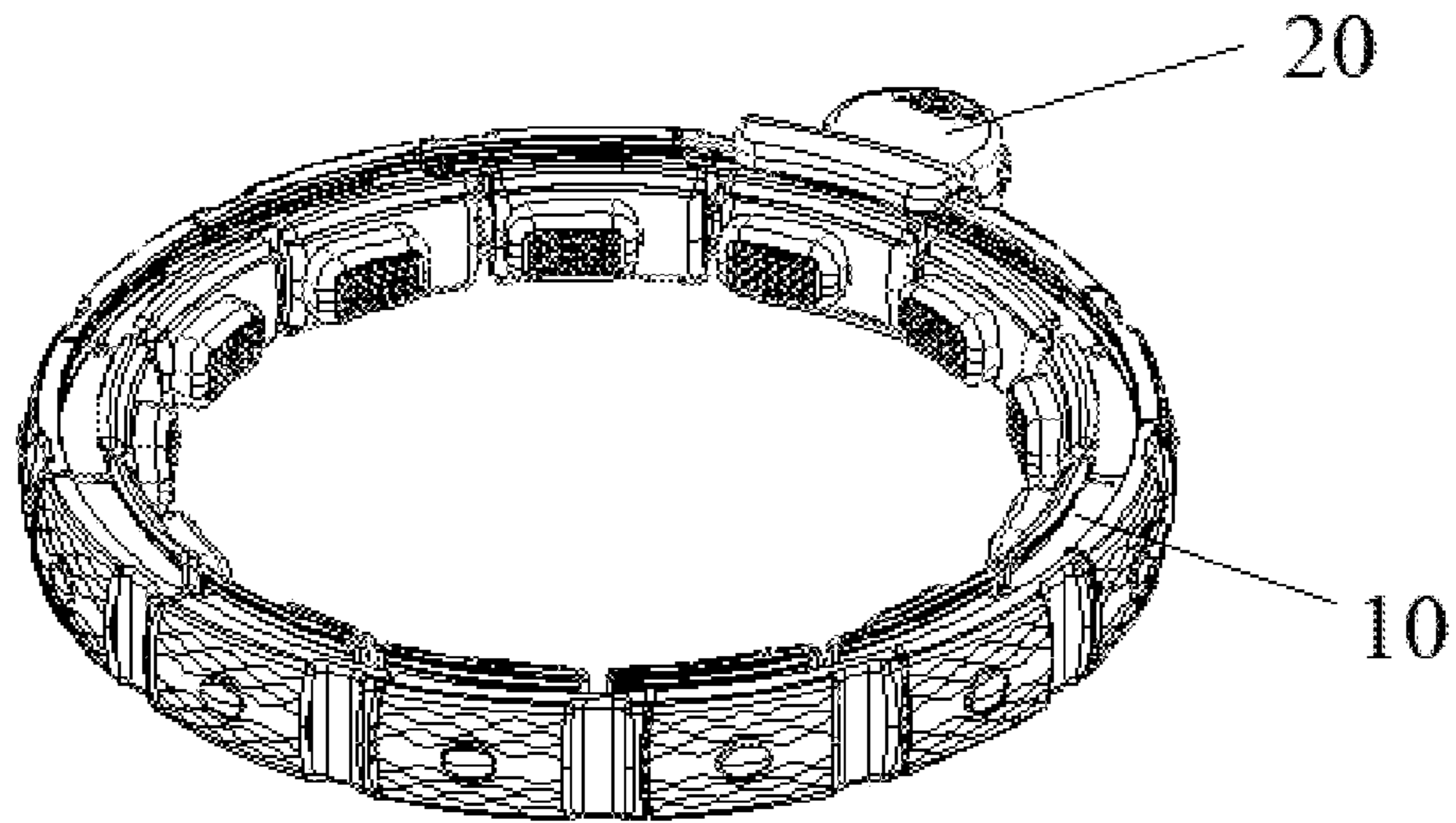


FIG. 1

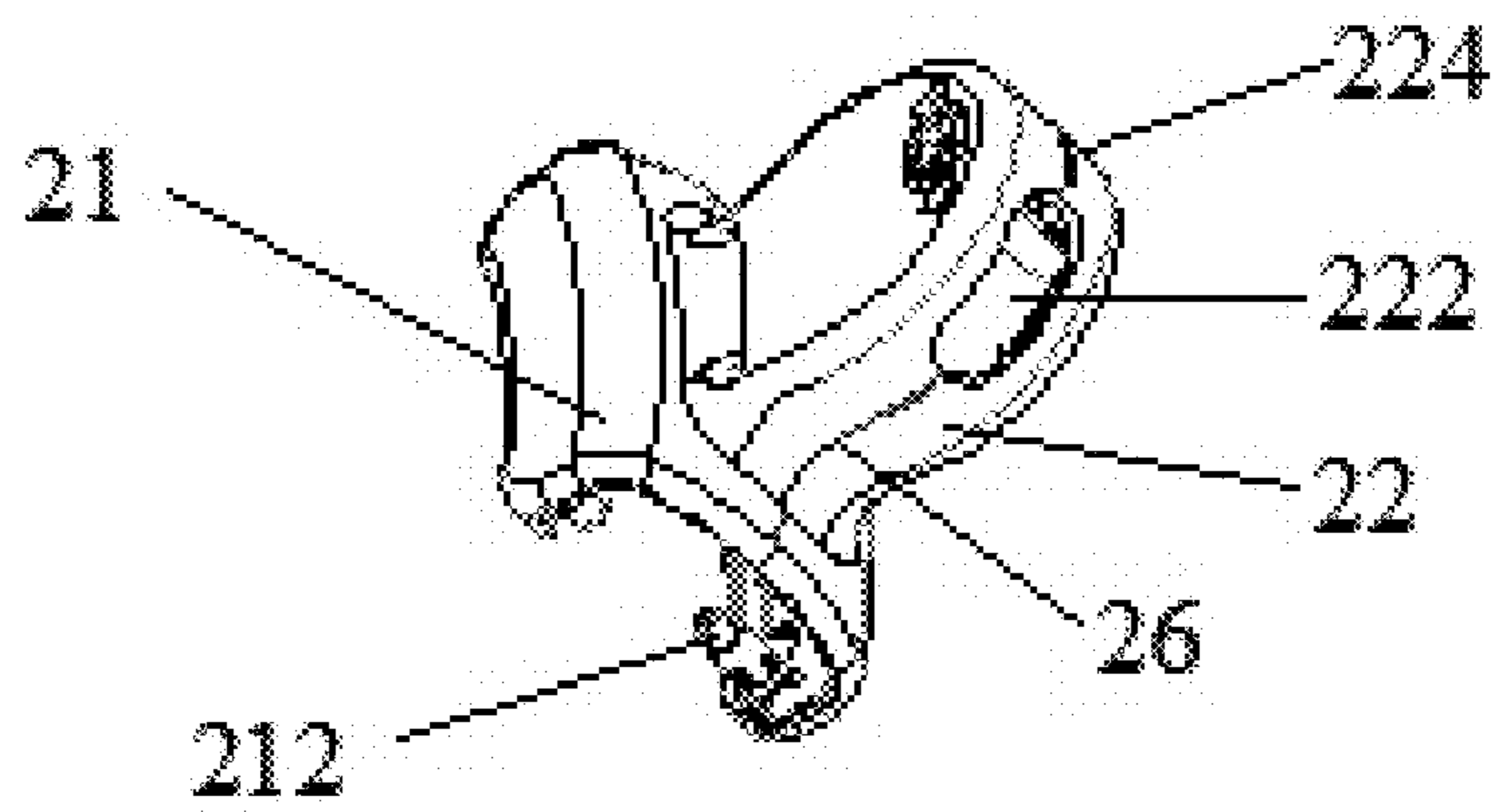


FIG. 2

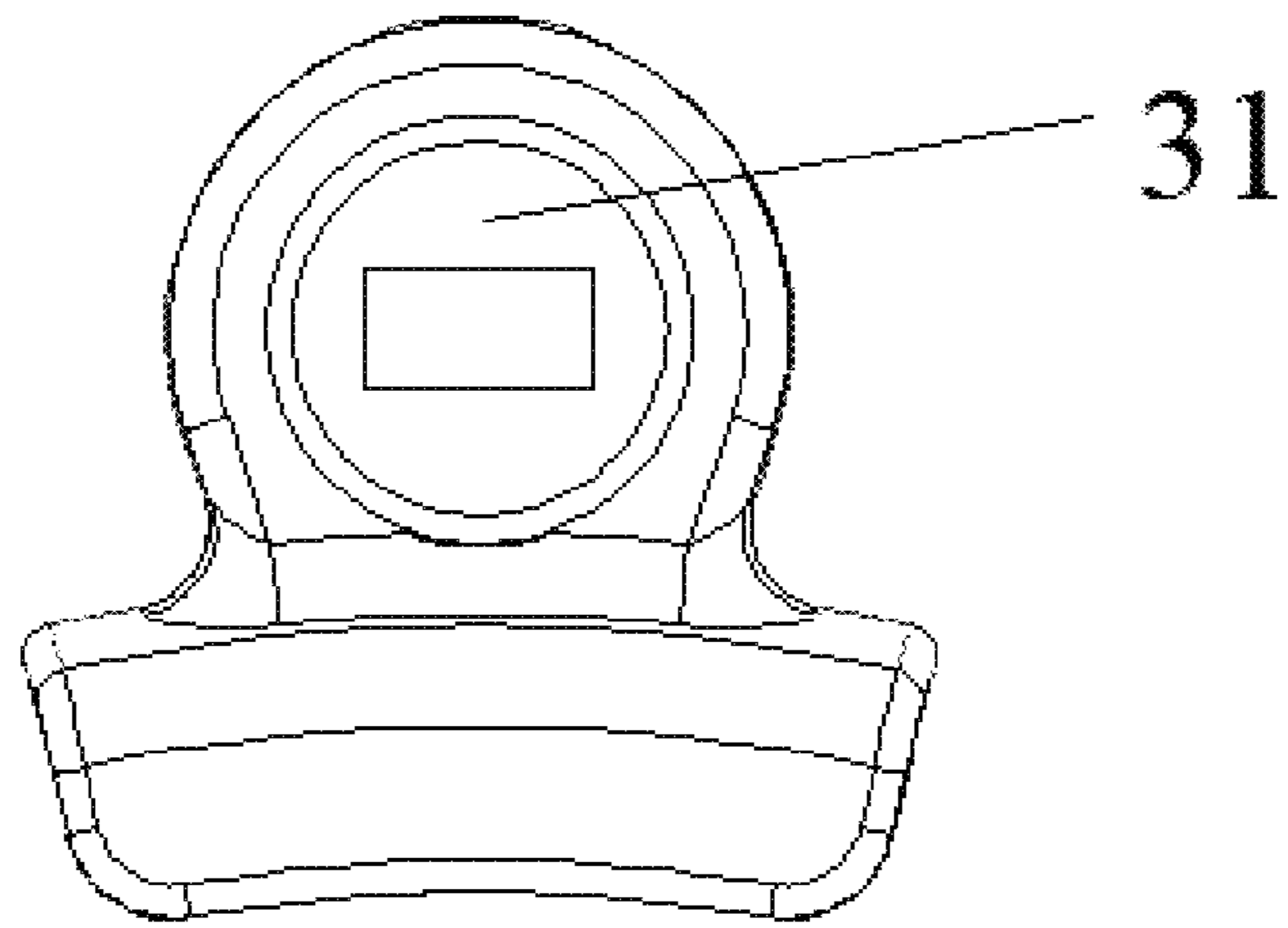


FIG. 3

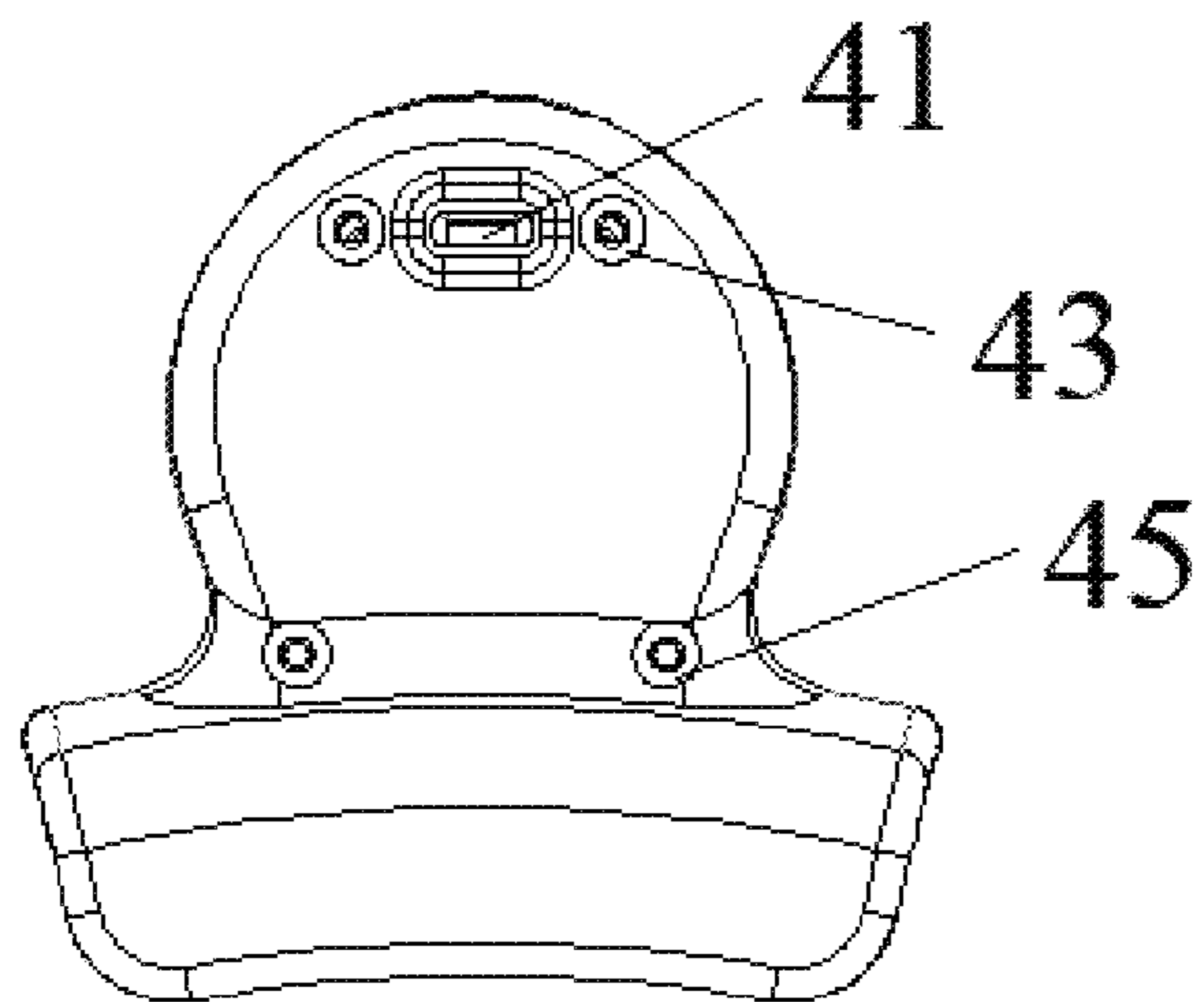


FIG. 4

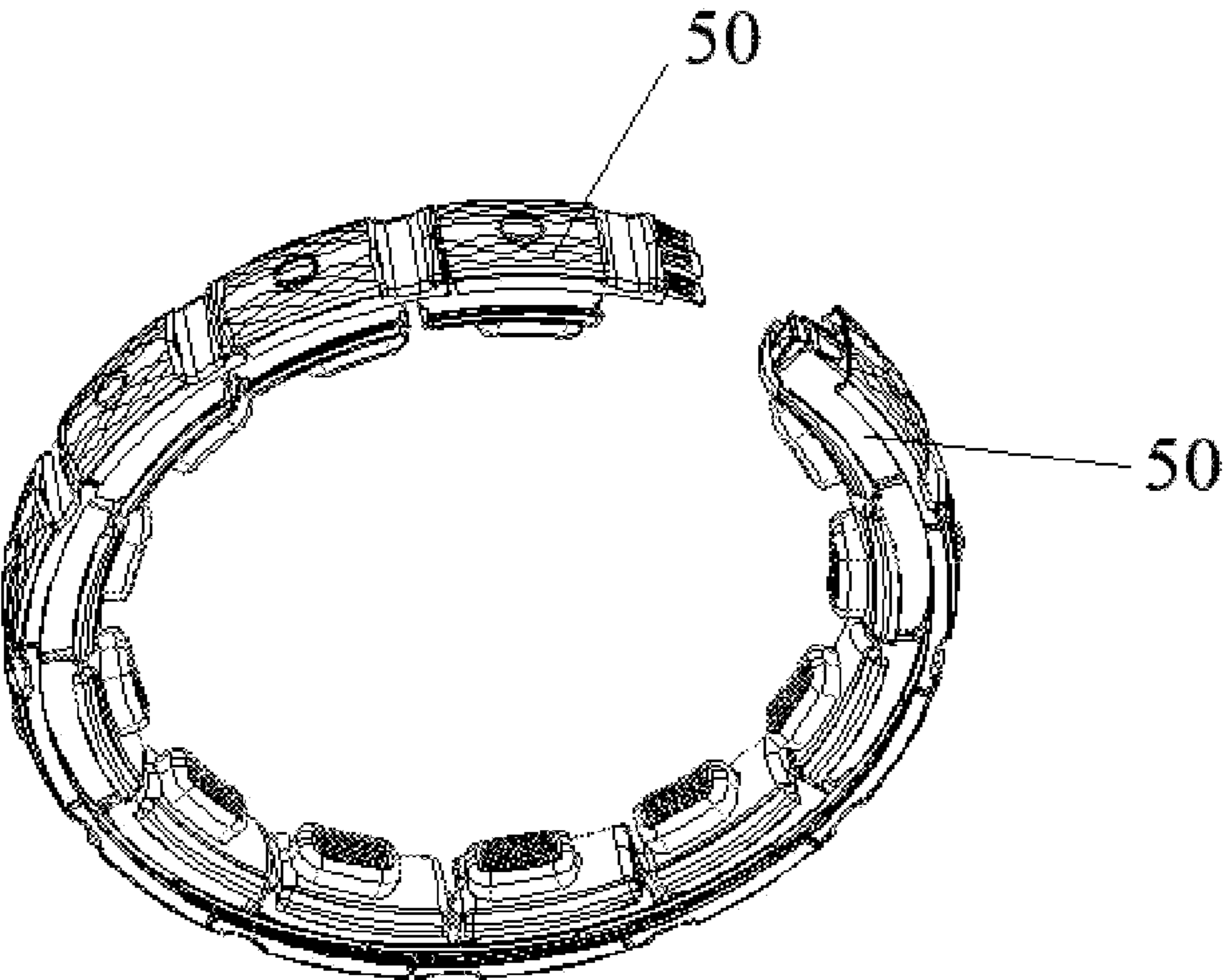


FIG. 5

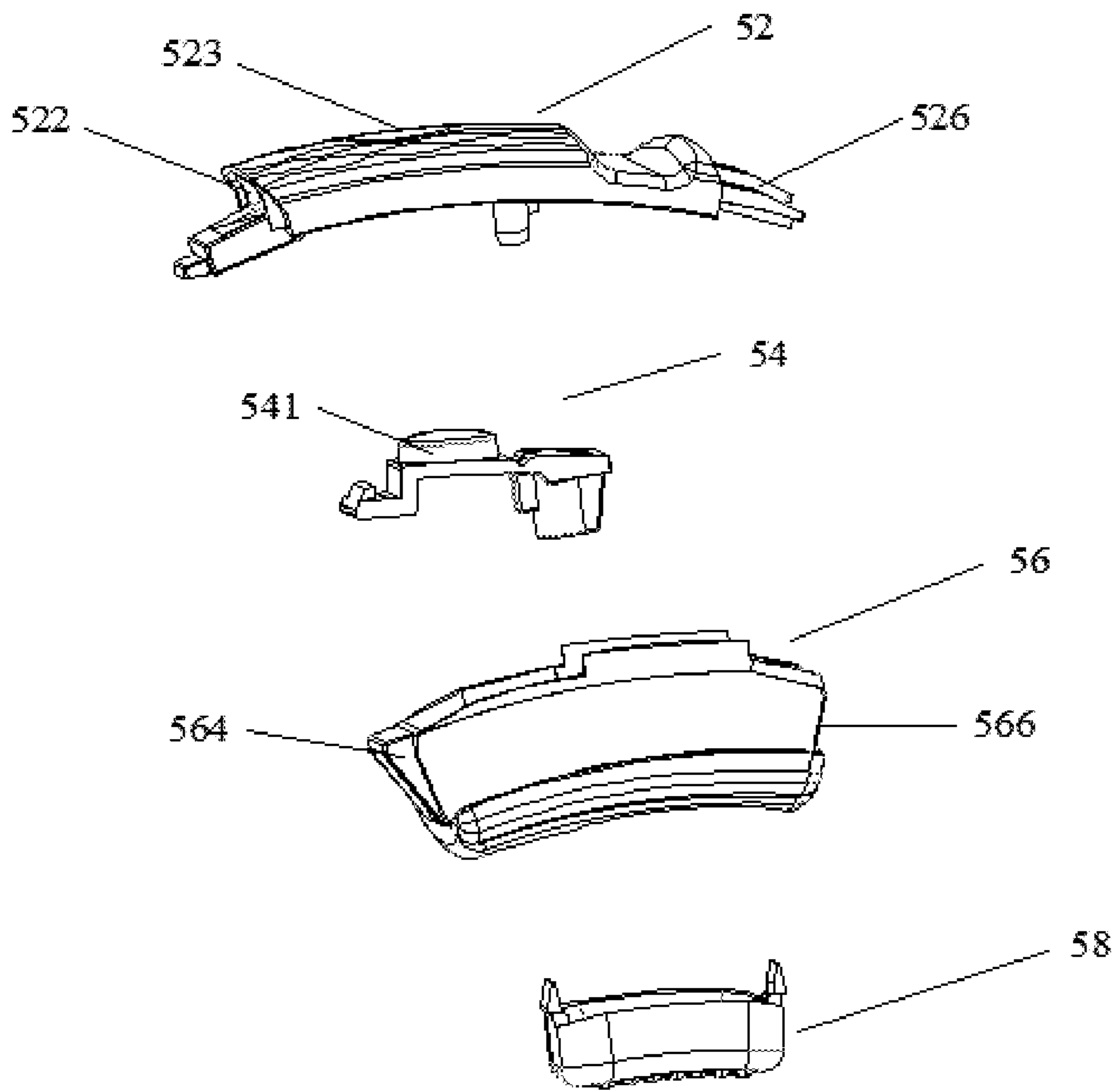


FIG. 6

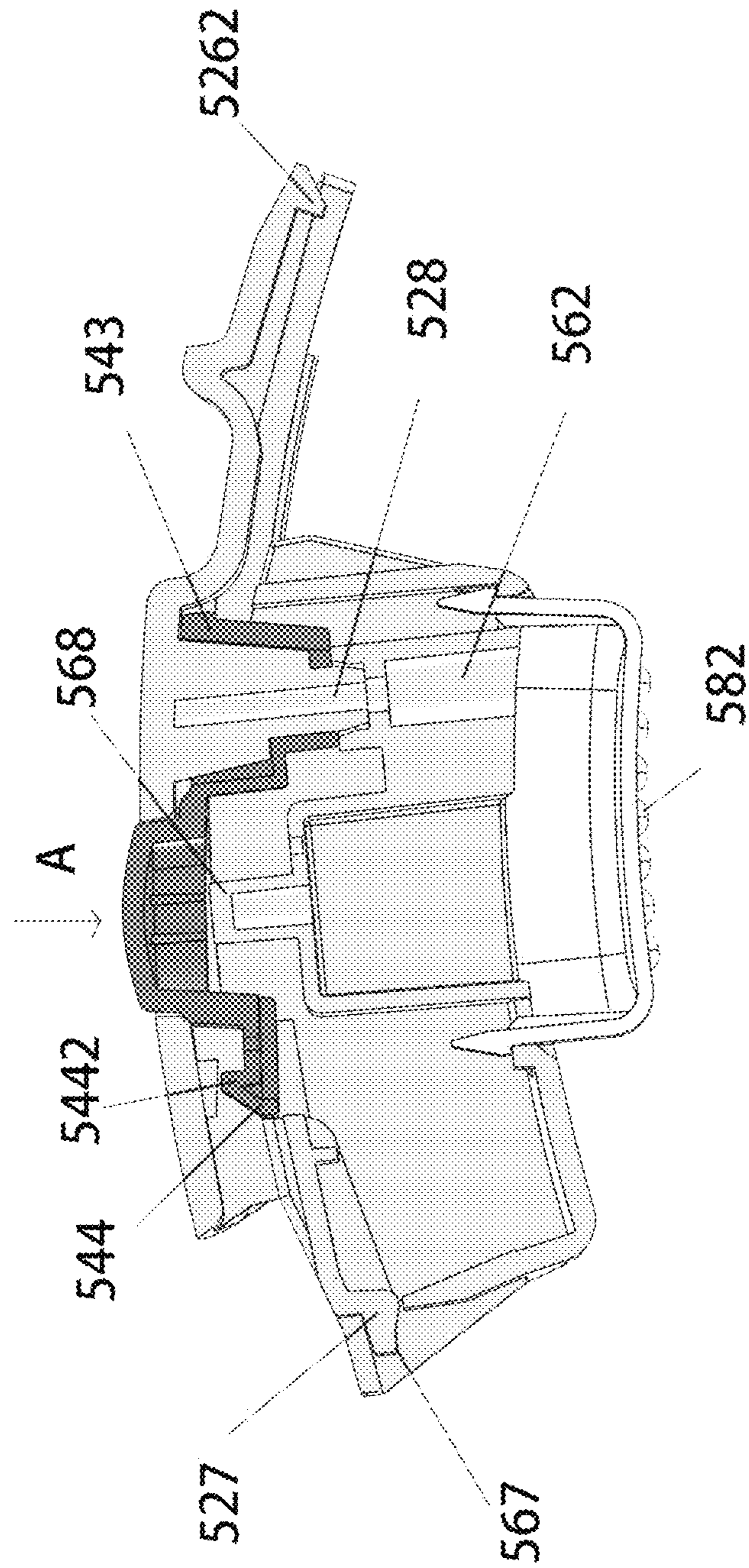


FIG. 7

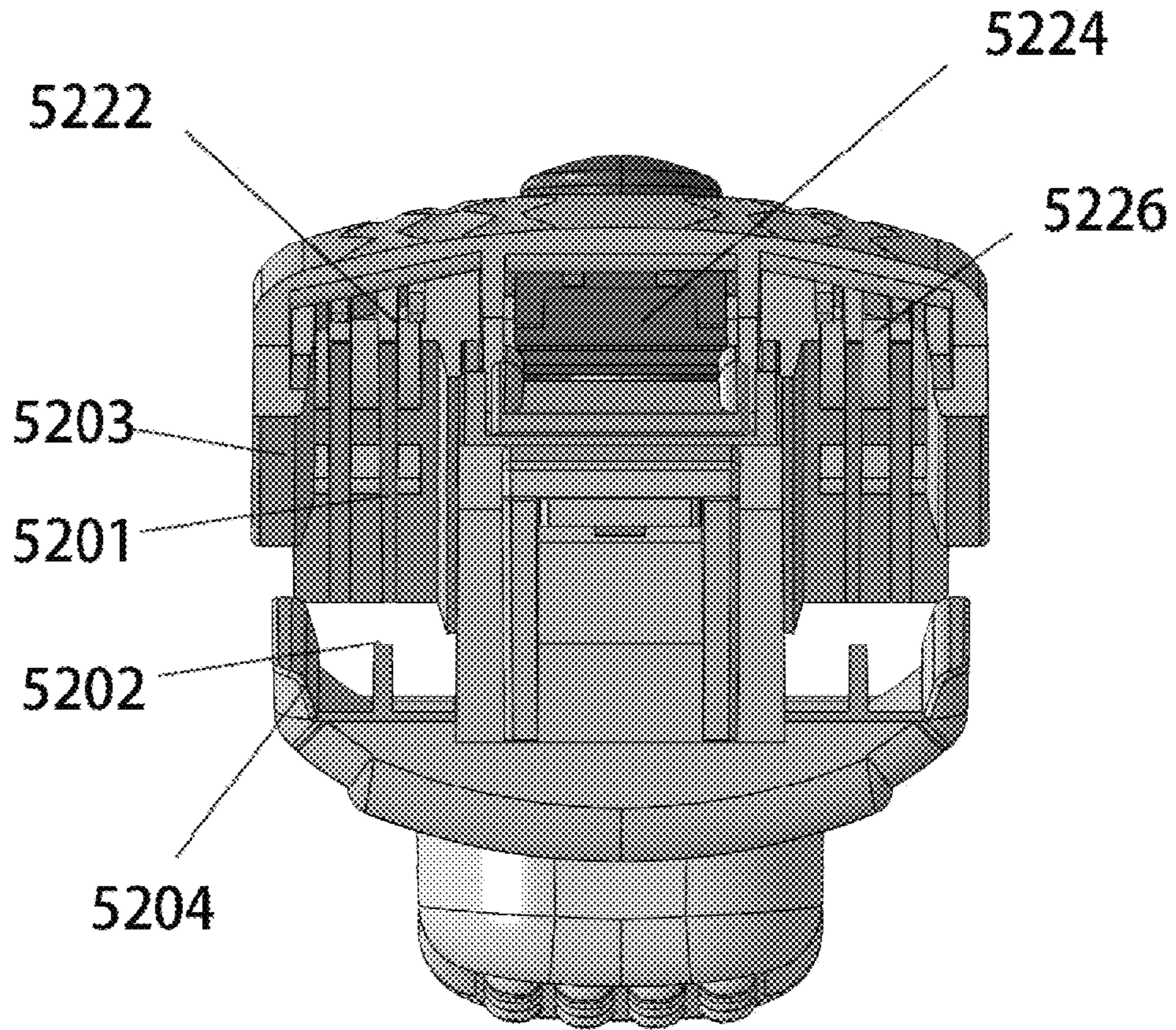


FIG. 8

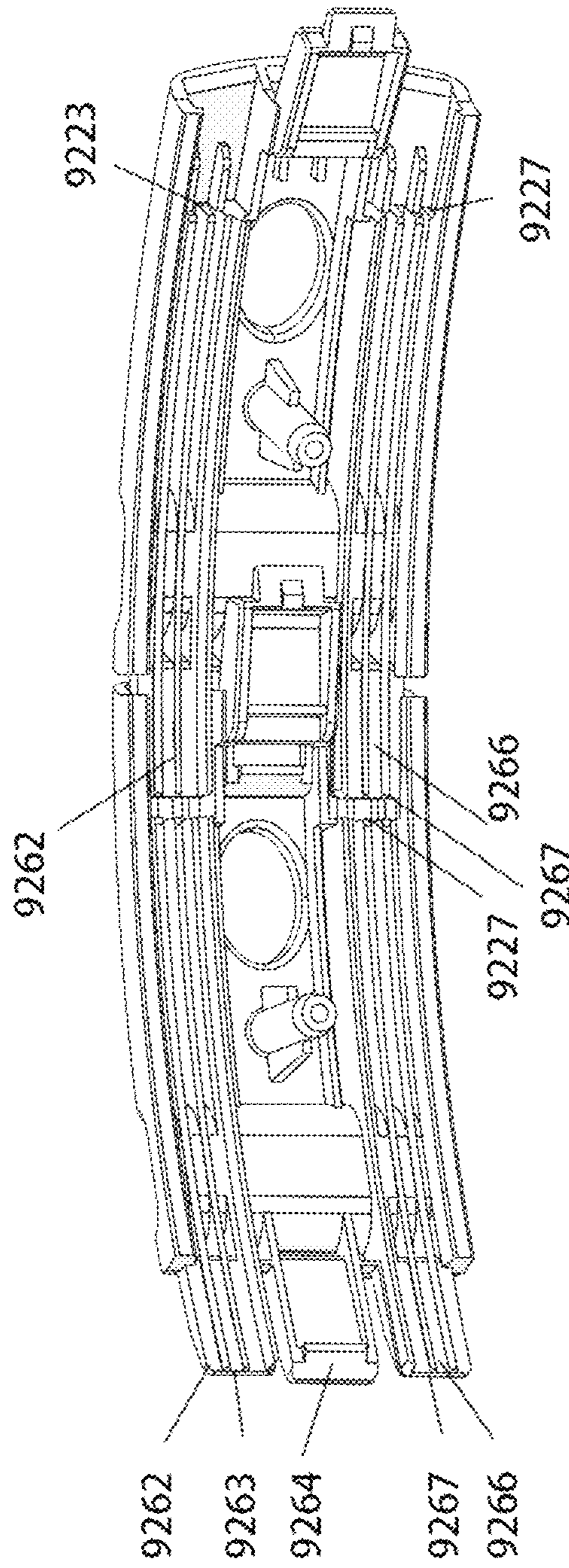


FIG. 9

1**HULA HOOP****CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims priority under 35 U.S.C. § 119(a) to Chinese Patent Application No. 2023111556369, filed on Sep. 7, 2023, which is hereby incorporated by reference herein in its entirety.

TECHNICAL FIELD

The present disclosure relates to a fitness equipment, particularly a hula hoop, and more particularly, a luminous hula hoop.

BACKGROUND ART

Hula hoop is a fitness equipment designed for exercising a waist area. Existing hula hoop is not limited to a singular, integral ring structure, and can also be assembled from multiple assembly parts. In this assembled configuration of the hula hoop, a loop worn around the user's waist defines a circular track, and a slider with an added weight moves along this circular track on the hoop.

Document CN216092050U discloses a luminous hula hoop including a hula hoop body consisting of a plurality of parts interconnected to form a loop structure, each provided with a light source and a light diffuser to make the hula hoop body emit light when necessary. This device requires the arrangement of luminous units in each of the parts.

Document CN217311770U discloses a silent smart hula hoop, comprising a hula hoop body, a counting device slidably connected to the hula hoop body, and an added weight fixedly connected to the counting device, wherein the hula hoop body includes a housing with tracks arranged at upper and lower ends on its inner side, and wherein rollers that can roll around the tracks are arranged on the counting device.

Currently, commercially available detachable hula hoop is composed of a plurality of units connected end-to-end, with a detachable connecting element positioned between adjacent units. Each unit is provided with a slot for the insertion of the connecting element, and both ends of the connecting elements are respectively inserted into the slots of two adjacent units. Moreover, the unit is provided with a locking mechanism to secure the connecting element within the slot. However, hula hoops of such configuration are prone to generating significant noise during use due to the looseness between units. Traditional noise reduction methods rely on reducing the number of units or designing more complex structures to achieve noise reduction.

SUMMARY

A hula hoop is provided to address the aforementioned technical problems.

According to embodiments in the present disclosure, the hula hoop comprises:

- a track assembly with a plurality of track units interconnected end-to-end, each track unit including:
 - a. an outer track having a receiving channel located at a first end and a protruding portion located at a second end opposite to the first end,
 - b. a pressing component configured to secure two adjacent track units, and

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- c. an inner track, which defines a circular path together with the outer track; and
- a slider provided with one or more rollers, which are configured to slide along the circular path.

5 In some embodiments, the slider includes a first half part and a second half part defined by a dividing plane, each half part having a base portion and an extending portion, wherein the base portion is provided with one or more roller bars, and wherein the rollers are mounted on the roller bars and are rotatable.

10 In some embodiments, each extending portion has a first opening, and the first openings of two extending portions jointly define a cavity for accommodating a light emitting device. The cavity of the slider is provided with the light emitting device, which enhances its entertainment value.

15 In some embodiments, the slider is provided with a controller and a sensor for detecting the movement of the slider, wherein the controller is configured to control the light emitting device based on the detection by the sensor.

20 In some embodiments, when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to emit lights of a first color, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to emit lights of a second color different from the first color.

25 In some embodiments, when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to flash at a first frequency, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to flash at a second frequency different from the first frequency.

30 In some embodiments, the rotation speed of the slider within the first speed range is lower than in the second speed range, and the second frequency is greater than the first frequency.

35 In some embodiments, the controller controls the light emitting device to continuously illuminate.

40 In some embodiments, when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to illuminate at a first brightness, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to illuminate at a second brightness different from the first brightness.

45 In some embodiments, the rotation speed of the slider within the first speed range is lower than in the second speed range, and the second brightness is greater than the first brightness.

50 In some embodiments, the hula hoop comprises an added weight, which is attached to the slider through a tether. The added weight includes a shell, and the shell is filled with at least one of water, sand, and metal particles (such as iron, copper, or alloy).

55 In some embodiments, the inner track is provided with a recess at the first end, and an engaging portion of the outer track is inserted into the recess, such that a secure connection between the inner track and the outer track along a direction substantially perpendicular to a positioning column can be achieved.

60 In some embodiments, the pressing component is switchable between a first position and a second position, wherein in the first position, an elastic element of the pressing component undergoes deformation to position away from a pressing body of the pressing component, and wherein in the second position, the elastic element of the pressing component is not under force and remains substantially stationary relative to the outer track and the inner track.

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In some embodiments, the inner track has a limiting column for restricting the movement of the pressing body operated by a user.

In some embodiments, the pressing component has a positioning body that defines a positioning channel, wherein the positioning column of the outer track extends through the positioning channel and is inserted into a positioning hole.

In some embodiments, the material for the roller is selected from at least one of nylon, polyoxymethylene (POM), acrylonitrile butadiene styrene (ABS), and polyurethane (PU), which is advantageous for reducing noise.

In some embodiments, the track unit comprises an outer track, an inner track connected to the outer track to jointly define a circular path, and a support fixed to the inner track.

In some embodiments, the support is positioned close to an end of the inner track.

The present disclosure provides a hula hoop that is easy to assemble and disassemble.

The present disclosure also provides a hula hoop with a light emitting device (such as LEDs).

The present disclosure also provides a hula hoop with an added weight filled with water, the amount of which is easy to adjust and convenient to replenish.

The present disclosure also provides a hula hoop comprising:

- a track assembly with a plurality of track units interconnected end-to-end, each track unit including:
 - a. an outer track having a receiving channel located at a first end and a protruding portion located at a second end opposite to the first end,
 - b. a pressing component configured to secure two adjacent track units, and
 - c. an inner track for jointly defining a circular path with the outer track; and
 - a slider provided with one or more rollers, which are configured to slide along the circular path,
- wherein the protruding portion of the outer track includes at least two side protruding fingers, and an intermediate protruding finger located between two side protruding fingers, and the side protruding fingers are configured to be inserted into side channels of the receiving channel, such that after assembly, a distance between an end face of the side protruding finger of the outer track and an end face for delimiting a side channel of an adjacent outer track is in the range of 0.5 mm to 10 mm.

The small gap between the outer tracks of the track units in the hula hoop in the present disclosure ensures that when the rollers of the slider slide along the circular path defined by both the inner and outer tracks, they do not pass through a long section with notches (which could hinder the slider's movement and result in significant noise). This design significantly reduces the generation of noise, especially when combined with the use of rollers made from the aforementioned materials, it can even achieve a silent operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a hula hoop according to an embodiment in the present disclosure.

FIG. 2 illustrates a perspective view of a slider according to an embodiment in detail.

FIG. 3 illustrates a front view of the slider.

FIG. 4 illustrates a rear view of the slider.

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FIG. 5 illustrates a track assembly including a plurality of track units according to an embodiment.

FIG. 6 illustrates an exploded view of the track unit according to an embodiment.

FIG. 7 illustrates a sectional view of the assembled track unit according to an embodiment.

FIG. 8 illustrates a receiving channel.

FIG. 9 illustrates two outer tracks during the assembly process.

In the drawings, identical or similar numbers represent identical or similar elements.

DETAILED DESCRIPTION

FIG. 1 illustrates a hula hoop according to an embodiment in the present disclosure. The hula hoop includes a track assembly 10 and a slider 20 that is slidable on the track assembly 10. The track assembly 10 can be worn around the user's waist, and the slider 20, connected to an added weight, can slide circumferentially as the user twists his/her waist.

FIG. 2 illustrates a perspective view of the slider 20 according to an embodiment in detail. The slider 20 may include two half parts defined by a dividing line or dividing plane 26, each half part having a base portion 21 and an extending portion 22 extending from the base portion 21. After assembly, the two half parts collectively define an inner cavity where various electronic components, such as sensors and controllers, can be arranged. This will be described in detail below.

Each base portion 21 has a substantially L-shaped cross-section, and the base portion 21 is provided with one or more roller bars 212, a roller (not shown) is mounted on each roller bar 212 and configured to rotate around the roller bar 212. The material of the roller can be selected from any one of: nylon, polyoxymethylene, ABS, polyurethane, or a combination thereof. Preferably, the roller can be made of wear-resistant TPU GU80. The use of the mentioned materials for the roller facilitates the generation of minimal noise.

In some embodiments, each extending portion 22 has a first opening 222, and the first openings 222 of two extending portions 22 can be matched to define a cavity in the assembled slider 20, which is used for accommodating, for example, light emitting elements such as LEDs. In some embodiments, preferably, two cavities are provided at curved side surface of the slider 20. Light emitting elements can be installed in the cavities of the slider 20, which can be enclosed, for example, by a plastic casing, such as a transparent plastic casing.

FIG. 2 also illustrates a tether opening 224 of the slider 20, which is used to introduce a tether to be connected that can be attached to the added weight. In some embodiments, the tether opening 224 is defined only by one of the two half parts (i.e., formed only in a single half part). In some embodiments, the tether opening 224 is defined by two half parts together.

FIGS. 3 and 4 respectively illustrate front view and rear view of the slider 20. The front side of the slider 20 may be provided with a display panel or control panel 31, which can integrate at least one button selected from, for example, a count button, a pause button and a reset button. The display panel or control panel 31 can also display exercise time and rotation counts. The opposite side, such as the back side, of the slider 20 can be provided with a charging port 41, for example, a USB port. The slider 20 further includes a plurality of holes 43, 45 for mounting bolts.

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In some embodiments, sensors, such as a speed sensor, especially an angular velocity sensor, can be arranged in the slider **20** to detect the sliding speed of the slider on the track assembly. A controller can also be arranged in the slider **20**, which can load a program executed to control, for example, LED illumination based on the values detected by the sensors. For instance, the LEDs can be controlled to emit different colors of light in a flashing or steady manner based on the sliding speed within different ranges. In some embodiments, for instance, a sensor sends the detected speed signals to the controller (such as a PLC), and the controller can control the LEDs to emit corresponding light based on the rotation speed of the slider **20**. For instance, when a rotation speed of a slider (or a hula loop) is within a lower speed range (e.g., 0-0.8 r/s), the controller sends a signal to keep the LEDs off; when the rotation speed is within a predefined first speed range (e.g., 0.8-1.2 r/s), the controller sends a signal to cause the LEDs to emit, for example, red light; when the rotation speed is within a predefined second speed range (e.g., 1.2-1.5 r/s), the controller sends a signal to cause the LEDs to emit, for example, blue light. In a further embodiment, the LEDs can flash at different frequencies or remain steadily illuminated. For example, as the rotation speed of the slider increases from 1.0 r/s to 1.4 r/s, the flashing frequency of the LEDs will increase. In some embodiments, the LEDs can illuminate at different brightness levels. Those skilled in the art should be appreciated that various colors of light (such as red, blue, purple, yellow) and different flashing frequencies can be adaptively selected.

FIG. 5 illustrates a track assembly having a plurality of track units **50** according to an embodiment, wherein adjacent track units **50** are interconnected end-to-end, preferably through a snap-fit connection.

FIG. 6 illustrates an exploded view of a track unit according to an embodiment, and FIG. 7 illustrates a sectional view of the assembled track unit according to an embodiment. As shown in FIGS. 6-7, each track unit (e.g., the track unit **50** shown in FIG. 5) includes an outer track **52**, an inner track **56**, and a pressing component **54**.

The outer track **52** includes a receiving channel **522** located at a first end and a protruding portion **526** located at a second end opposite to the first end. The protruding portion **526** of the outer track **52** can be inserted into the receiving channel **522** of an adjacent outer track **52**. Through this design, the connection between adjacent track units **50** is less prone to loosening, thus avoiding the noise caused by loosely connected track units. FIG. 8 provides a clearer illustration of the receiving channel **522**, wherein the receiving channel **522** includes side channels **5222**, **5226** that at least partially define tracks (i.e., the tracks on which the rollers of the slider travel), and an intermediate channel **5224** located between the side channels **5222**, **5226**. Correspondingly, the protruding portion **526** of the outer track **52** includes three protruding fingers for inserting into the channels **5222**, **5226**, and **5224**. The interconnected adjacent outer tracks are locked through a pressing component **54**, which will be described below.

The inner track **56** has a positioning hole **562**, and a positioning column **528** of the outer track **52** can be inserted into the positioning hole **562** to achieve fixation between the inner track **56** and the outer track **52** (as best shown in FIG. 7). The inner track **56** further includes a male part **564** located at a first end and a female part **566** located at a second end opposite to the first end, wherein the male part **564** of the inner track **56** can engage with a female part **566** of an adjacent inner track. For instance, the male part **564** and the female part **566** have complementary contours.

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The inner track **56** can be also provided with a recess **567** at the first end, and an engaging portion **527** of the outer track **52** can be inserted into the recess **567**, such that a secure connection between the inner track **56** and the outer track **52** along a substantially vertical direction (i.e., substantially perpendicular to the direction of the positioning columns **528**) can be achieved.

Referring to FIGS. 5-8, it can be seen that the connection point between two adjacent track units is located at the ends of the track units, and the connection point between the inner track and the outer track of the track unit is located between both ends of the track unit.

The pressing component **54** has a pressing body **541**, which can be embedded into a hole on an outer surface of the outer track **52** and extends beyond the outer surface of the outer track **52** after assembly. This allows a user to easily press the pressing body **541** of the pressing component **54** along a pressing direction A. The pressing component **54** also has a positioning body **543** that defines a positioning channel. The positioning column **528** of the outer track **52** can extend through the positioning channel and be inserted into the positioning hole **562**. The pressing component **54** is clamped and fixed by the outer track **52** and inner track **56** during use, in particular, the positioning body **543** of the pressing component **54** remains substantially stationary relative to the outer track **52** and/or inner track **56** during use. The pressing component **54** also includes an elastic element **544**. When an intermediate protruding piece of a protruding portion **526** of an outer track **52** of an adjacent track unit is inserted into the intermediate channel **5224** of the receiving channel of the track unit **50**, the elastic element **544** is deformed away from the pressing body **541** until a hook element **5262** of the intermediate protruding piece passes over a hook element **5442** of the elastic element **544**. Afterward, the elastic element **544** returns to restrict the hook element **5262** of the intermediate protruding piece. In this way, two adjacent track units are securely engaged together. When a user presses down the pressing body **541** of the pressing component **54** along the pressing direction A, the elastic element **544** is deformed away from the pressing body **541**. In this deformed state of the elastic element **544**, the user can detach one of two adjacent track units from another.

In some embodiments, the inner track **56** has a limiting column **568** to restrict the movement of the pressing body **541** during user operation, preventing, for example, the integral pressing component **54** from breaking.

In some embodiments, the track unit may also include a support **58**. The support **58** may be in a form of tank, with its upper end fitting into the inner track **56**. A bottom surface of the support **58** can be provided with multiple spherical or hemispherical elements **582**. The support **58** can be in direct contact with the user's waist. Therefore, the support **58** with the above designs can be served as a massage member. The support **58** is preferably positioned close to an end of the track unit, in particular the inner track, which is advantageous to prevent two supports of the adjacent track units from pinching the user's skin and causing injury. In some embodiments, the position and dimensions of the support **58** can be designed according to the requirements.

FIG. 8 illustrates a track configuration for the rollers of the slider in detail. The outer track has an outer surface **5201** for contact with the rollers, and the inner track has an outer surface **5202** for contact with the rollers. The dimension of the gap between the outer surface **5201** and the outer surface **5202** allows the rollers to roll smoothly between them. The

outer track and the inner track further have limiting features **5203** and **5204** to prevent the rollers from leaving the track.

In some embodiments, the added weight may have a closed shell, such as a flexible plastic shell, with an opening to allow filling with water, sand, or similar material. A cover of the added weight can close the opening and seal the shell. The shell of the added weight has features that allow the connection of the tether.

FIG. 9 illustrates two outer tracks during the assembly process, with other components of the track units hidden. The protruding portion of the outer track may include side protruding fingers **9262**, **9266**, and an intermediate protruding finger **9264** located between them. As mentioned above, the intermediate protruding finger **9264** is used for the snap-fit connection between two adjacent outer tracks or track units. The side protruding fingers **9262**, **9266** are inserted into the side channels **5222** and **5226** of the receiving channel **522**, respectively. After assembly, a distance between an end face **9263** of the side protruding finger **9262** of the outer track and an end face **9223** for delimiting the side channel of the adjacent outer track is in the range of 0.5 mm to 10 mm, particularly in the range of 1 mm to 5 mm, and more particularly in the range of 1.5 mm to 3 mm, such as 2 mm. Similarly, after assembly, a distance between an end face **9267** of the side protruding finger **9266** of the outer track and an end face **9227** for delimiting the side channel of the adjacent outer track is in the range of 0.5 mm to 10 mm, particularly in the range of 1 mm to 5 mm, and more particularly in the range of 1.5 mm to 3 mm, such as 2 mm. This design ensures that when the rollers of the slider roll along a circular path defined by both the inner and outer tracks, they do not pass through a long section with notches (which could hinder the slider's movement and result in significant noise). This design significantly reduces the generation of noise, especially when combined with the use of rollers made from the aforementioned material, it can even achieve a silent operation.

The above merely describes specific embodiments of the present disclosure, which is not intended to limit the scope of protection of the present disclosure. Any modifications, equivalent variations or substitutions, and improvements made within the spirit and principle of the present disclosure by those skilled in the art according to the disclosed technical scope should be included in the protection scope of the present disclosure.

The invention claimed is:

1. A hula hoop, comprising:

a track assembly with a plurality of track units interconnected end-to-end, and

a slider provided with one or more rollers configured to slide along a circular path,

wherein each track unit of the plurality of track units includes an outer track having a receiving channel located at a first end and a protruding portion located at a second end opposite to the first end,

wherein the protruding portion of the outer track includes side protruding fingers and an intermediate protruding finger located between the side protruding fingers, and the side protruding fingers of one track unit is configured to be inserted into respective side channels of the receiving channel of another track unit, such that after the track units are assembled, a distance between an end face of the side protruding finger of the outer track of the one track unit and an end face that delimits the side channel of another track unit within which the protruding finger is inserted is in the range of 0.5 mm to 10 mm,

and wherein the slider is provided with a light emitting device.

2. The hula hoop according to claim 1, wherein the slider includes a first half part and a second half part defined by a dividing plane, each half part having a base portion and an extending portion, wherein the base portion is provided with one or more roller bars, and wherein the rollers are mounted on the roller bars and are rotatable.

3. The hula hoop according to claim 2, wherein each extending portion has a first opening, and the first openings of two extending portions jointly define a cavity for accommodating the light emitting device, and the light emitting device is arranged within the cavity.

4. The hula hoop according to claim 3, wherein the slider is provided with a controller and a sensor for detecting movement of the slider, and wherein the controller is configured to control the light emitting device based on the detection by the sensor.

5. The hula hoop according to claim 4, wherein when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to emit lights of a first color, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to emit lights of a second color different from the first color.

6. The hula hoop according to claim 4, wherein when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to flash at a first frequency, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to flash at a second frequency different from the first frequency.

7. The hula hoop according to claim 6, wherein the rotation speed of the slider within the first speed range is lower than that in the second speed range, and the second frequency is greater than the first frequency.

8. The hula hoop according to claim 4, wherein the controller controls the light emitting device to continuously illuminate.

9. The hula hoop according to claim 4, wherein when the slider's rotation speed is within a first speed range, the controller controls the light emitting device to illuminate at a first brightness, and when the slider's rotation speed is within a second speed range, the controller controls the light emitting device to illuminate at a second brightness different from the first brightness.

10. The hula hoop according to claim 9, wherein the rotation speed of the slider within the first speed range is lower than that in the second speed range, and the second brightness is greater than the first brightness.

11. The hula hoop according to claim 1, wherein each track unit comprises:

a pressing component configured to secure two adjacent track units, and

an inner track, which defines a circular path together with the outer track.

12. The hula hoop according to claim 11, wherein the pressing component is switchable between a first position and a second position, wherein in the first position, an elastic element of the pressing component is forced to deform away from a pressing body of the pressing component, and wherein in the second position, the elastic element of the pressing component is not forced and remains stationary relative to the outer track and/or the inner track.

13. The hula hoop according to claim 12, wherein the inner track has a limiting column for restricting movement of the pressing body operated by a user.

14. The hula hoop according to claim 1, wherein the hula hoop is provided with an added weight, which is attached to the slider through a tether, and wherein the added weight includes a shell, and the shell is filled with at least one of water, sand, and metal particles. 5

15. The hula hoop according to claim 1, wherein a material for the roller is selected from at least one of nylon, polyoxymethylene, acrylonitrile butadiene styrene, and polyurethane.

16. The hula hoop according to claim 1, wherein each track unit comprises: 10

the outer track,

an inner track connected to the outer track to jointly define a circular path, and

a support fixed to the inner track. 15

17. The hula hoop according to claim 16, wherein the support is positioned close to an end of the inner track.

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